Homework 2–21-241, Matrices and Linear Transformations

Name: _____
Section: _____

Instructions: Complete the following problems, clearly labeling the problems. Staple this sheet, with your name and section filled in, to the top of your work. Failure to attach this sheet will result in a three-point deduction in the grade. The assignment will be graded out of fifty points.

DUE: BEGINNING OF CLASS FRIDAY, FEBRUARY 3, 2017

Book Problems

1. Section 2.1: 2, 4, 6, 14, 36
2. Section 2.2: 24, 26, 28, 30, 48
3. Section 2.3: 8, 24, 26, 30, 46

Other Problems

1. For some fixed θ, put the augmented matrix

$$\left[\begin{array}{cc|c} \cos\theta & \sin\theta & 0 \\ -\sin\theta & \cos\theta & 0 \end{array}\right]$$

   into reduced row echelon form. **Hint:** Remember to make sure you are not dividing by zero in the row reduction. Try using two cases.

2. Consider the linear system

$$2x - y = 5$$
$$4x - 2y = t.$$

(a) Determine all values of t such that the system is consistent. What is the solution in terms of t?

(b) Determine all values of t for which the system is inconsistent.

3. Using MATLAB, find the reduced row echelon form for the augmented matrix corresponding to the system

$$\begin{cases} x + \frac{1}{2}y + \frac{1}{3}z = 1 \\ \frac{1}{2}x + \frac{1}{3}y + \frac{1}{4}z = \frac{11}{18} \\ \frac{1}{3}x + \frac{1}{4}y + \frac{1}{5}z = \frac{9}{20}. \end{cases}$$

Use your result to describe the solution set to the system.